

**I CLAIM:**

1. A multi-layer circuit board comprising:

first, second, third, fourth, fifth, sixth and  
seventh insulating substrates disposed sequentially  
5 one above the other;

a first signal wiring layer disposed on one side of  
said first insulating substrate opposite to said second  
insulating substrate;

10 a first ground wiring layer disposed between said  
first and second insulating substrates;

a second signal wiring layer disposed between said  
second and third insulating substrates;

a second ground wiring layer disposed between said  
third and fourth insulating substrates;

15 a power wiring layer disposed between said fourth  
and fifth insulating substrates;

a third signal wiring layer disposed between said  
fifth and sixth insulating substrates;

20 a third ground wiring layer disposed between said  
sixth and seventh insulating substrates; and

a fourth signal wiring layer disposed on one side  
of said seventh insulating substrate opposite to said  
sixth insulating substrate;

25 wherein each of said first and seventh insulating  
substrates has a thickness ranging from 2.5 to 7.5 mil;

wherein each of said second and sixth insulating  
substrates has a thickness ranging from 3 to 13 mil;

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wherein each of said third and fifth insulating substrates has a thickness ranging from 3 to 15 mil;

wherein said fourth insulating substrate has a thickness ranging from 2 to 6 mil;

5 wherein said first signal wiring layer has a first resistance with respect to said first ground wiring layer, said second signal wiring layer having a second resistance with respect to said first and second ground wiring layers, said third signal wiring layer having  
10 a third resistance with respect to said third ground wiring layer and said power wiring layer, said fourth signal wiring layer having a fourth resistance with respect to said third ground wiring layer; and

wherein said first, second, third and fourth resistances are within the range of 49.5 to 60.5 ohms.

15 2. The multi-layer circuit board of Claim 1, wherein at least one of said first, third, fifth and seventh insulating substrates is made from a polyester prepreg.

3. The multi-layer circuit board of Claim 1, wherein  
20 at least one of said second, fourth and sixth insulating substrates is made from a fibrous core material.

4. The multi-layer circuit board of Claim 3, wherein the core material contains paper fibers.

5. The multi-layer circuit board of Claim 3, wherein  
25 the core material contains glass fibers.

6. The multi-layer circuit board of Claim 1, wherein the thicknesses of said first and seventh insulating

substrates are equal.

7. The multi-layer circuit board of Claim 1, wherein the thicknesses of said second and sixth insulating substrates are equal.

5 8. The multi-layer circuit board of Claim 1, wherein the thicknesses of said third and fifth insulating substrates are equal.

9. The multi-layer circuit board of Claim 1, wherein:  
each of said first and fourth signal wiring layers  
10 has a thickness of about 1.4 mil; and

each of said second and third signal wiring layers,  
said first, second and third ground wiring layers, and  
said power wiring layer has a thickness of about 0.7  
mil.

15 10. The multi-layer circuit board of Claim 1, wherein:  
each of said first and seventh insulating substrates  
has a thickness of  $4.5 \pm 2$  mil;

each of said second and sixth insulating substrates  
has a thickness of  $6 \pm 3$  mil;

20 each of said third and fifth insulating substrates  
has a thickness of  $7 \pm 4$  mil; and

said first, second, third, fourth, fifth, sixth and  
seventh insulating substrates, said first, second,  
third and fourth signal wiring layers, said first,  
25 second and third ground wiring layers, and said power  
wiring layer are press-bonded to each other to form said

circuit board with a thickness of about 1.2 mm.

11. The multi-layer circuit board of Claim 10, wherein:

each of said first and seventh insulating substrates has a thickness of 4.5 mil;

5 each of said second and sixth insulating substrates has a thickness of 6 mil;

each of said third and fifth insulating substrates has a thickness of 7 mil; and

10 said fourth insulating substrate has a thickness of 4 mil.

12. The multi-layer circuit board of Claim 1, wherein:

each of said first and seventh insulating substrates has a thickness of  $5.5 \pm 2$  mil;

15 each of said second and sixth insulating substrates has a thickness of  $10 \pm 3$  mil;

each of said third and fifth insulating substrates has a thickness of  $11 \pm 4$  mil; and

20 said first, second, third, fourth, fifth, sixth and seventh insulating substrates, said first, second, third and fourth signal wiring layers, said first, second and third ground wiring layers, and said power wiring layer are press-bonded to each other to form said circuit board with a thickness of about 1.6 mm.

13. The multi-layer circuit board of Claim 12, wherein:

25 each of said first and seventh insulating substrates has a thickness of 5.5 mil;

each of said second and sixth insulating substrates has a thickness of 10 mil;

each of said third and fifth insulating substrates has a thickness of 11 mil; and

5        said fourth insulating substrate has a thickness of 4 mil.

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